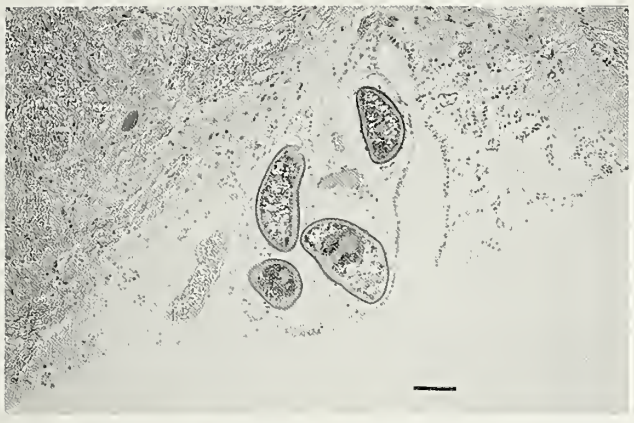

Fig. 1. Section through a brain of minnow showing *Diplostomum phoxini*. Scale Bar=100 μm.

Diplostomum phoxini was first recorded in the British Isles by Ashworth and Bannerman (1927) who described specimens from minnows from a stream near Edinburgh and Loch Lubnaig, Stirlingshire. Other records of *D. phoxini* in the British Isles (cited in Kennedy 1974) are from the River Clyde, Loch Leven, Loch Eck, Loch Lomond, Frogoch Lake, Wales, the Royal Canal and River Main, Ireland and the River Roding, Essex. The infection dynamics of *D. phoxini* were described in the R. Endrick, Stirling District and in Loch Maragan in the central highlands (Barber & Crompton, 1997 b). From examination of serial histological sections metacercariae of *D. phoxini* were found to be mainly distributed in the cerebellum, medulla oblongata and the optic lobes, areas implicated in the control of the host's antipredator response. This would enhance the possible of transmission to the final host.

The present record in minnows from the Scottish highlands indicates the wide distribution of the parasite in minnows in the British Isles. Minnows are the second intermediate host in the life cycle of *D. phoxini* and become infected when cercariae are released from the lymnaid snails and penetrate the fishes' skin (Barber & Crompton, 1997, a). Although a range of vertebrates has been used as definitive hosts, piscivorous birds, usually gulls (Laridae), are the main definitive host in natural habitats (Yamaguti, 1958) and these become infected by eating infected minnows. The adult trematodes produce eggs which pass with faeces from the host and, on hatching, free-living miracidia larvae are released, infecting snails, the first intermediate host (Barber & Crompton, 1997, b).

I am grateful to Ross Campbell and Sheila Henderson of Mallaig Marine World for providing samples and assistance during the study.

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Notes on the Marine Tardigrade *Megastygarctides seteloso* Morgan and O'Reilly, 1989

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The Tardigrades, or Water-Bears, comprise a phylum of minute arthropod-like animals common in aquatic environments or on the surface water film of terrestrial mosses. Marine species are relatively few in number with only 16 recorded from British waters. The tardigrade fauna of the Clyde Sea Area was described by Morgan & Lampard (1986) and a revised key to all Scottish (and UK) marine species was provided by Morgan & O'Reilly (1989).

The most recently described British species, *Megastygarctides seteloso*, is known only from the holotype male specimen collected in the Summer Isles, North West Scotland, in July 1985. The opportunity is taken here to provide notes on its discovery and to further illustrate aspects of its morphology based on a re-examination of the holotype.

The single specimen of *M. seleloso* was recovered from a scoop of surfaces and collected by a diver at 16 m depth in The Anchorage, Tanera Mor. The sampling was being undertaken as part of a programme to study benthic harpacticoid copepods, especially of the genus *Haloschizopera* (see Moore & O'Reilly 1989, 1993). The sample was fixed with 4% formaldehyde and subsequently elutriated onto at 45μm sieve. The elutriate residue was sorted, by the present author, on a stereo microscope to remove copepods and during this process a tiny tardigrade was noticed. This was sent to Clive Morgan who confirmed it as a new species of the genus *Megastygarctides*. Hitherto only two *Megastygarctides* species had been described, both from the Pacific Ocean: *M. orbiculatus* McKirdy *et al.*, 1976 from the Galapagos Islands, and *M. isounguis* Renaud-Mornant, 1981 from New Caledonia.

In view of this interesting find a thorough re-inspection of the sample residue was undertaken by Dr Morgan in 1986. Several specimens of another tardigrade, *Halechiniscus perfectus* Schula, 1955, were recovered, this species being previously unknown in Scottish waters, but no further specimens of *M. seteloso* came to light and none have been recorded since.

A full description of *M. seteloso* was provided by Morgan & O'Reilly (1989) accompanied by a morphometric comparison with the two Pacific species. However, the illustration contained a minor inaccuracy with respect to the positioning of the posterior clava and lateral cirrus A, and the dorsal view displayed only the posterior pair of legs. The arrangement of the clavae as well as the structure of the legs are critical taxonomic characters in tardigrades and for this reason the habitus of the holotype is re-figured to exhibit and clarify these features (Fig. 1).

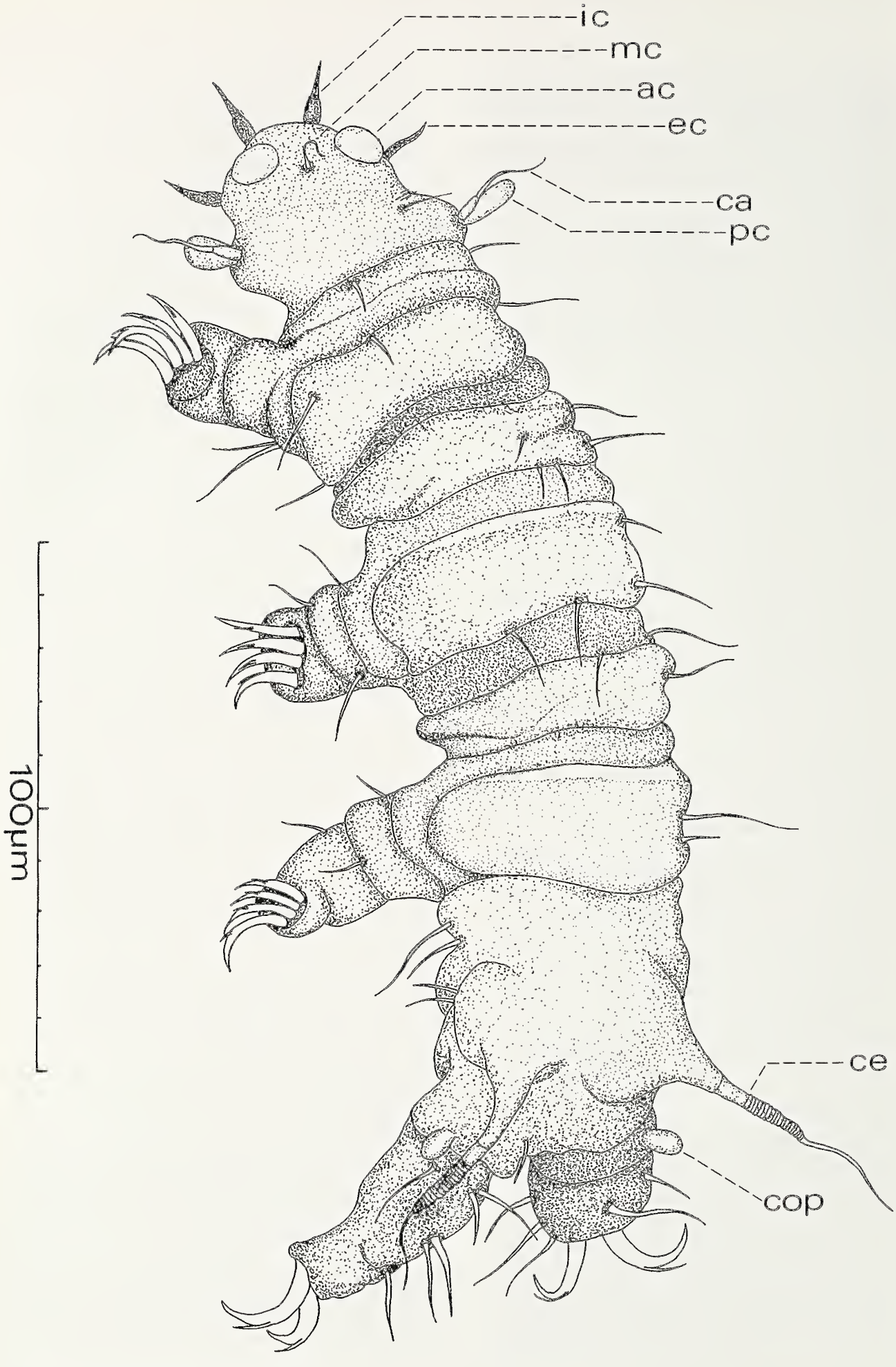

Figure 1 - *Megastygarctides seteloso* holotype male

(*ic* - internal cirrus, *mc* - median cirrus, *ac* - anterior clava, *ec* - external cirrus, *ca* - cirrus A, *pc* - posterior clava, *ce* - cirrus E, *cop* - coxal papilla)

The head bears a pair of internal cirri (*ic*) anteriorly, a pair of external cirri (*ec*) laterally and a single median cirrus (*mc*) dorsally. The anterior clavae (*ac*) are ovoid and placed dorsally on the head bearing a superficial resemblance to a pair of eyes. The cirrus A (*ca*) arises from the base of the posterior clava (*pc*). The previous illustration of Morgan & O'Reilly (1989) suggests that cirrus A is ventral to the clava. However, careful re-examination of the holotype indicates that, as in the Pacific species, the cirrus is in fact positioned dorsally to the clava.

The holotype specimen is presently mounted in a slightly skewed position. This enables observation of the forelegs on the left side and both rear legs. The combination of 4-clawed forelegs and 2-clawed rear legs is unique among British tardigrades. All the claws have a tiny accessory spur on the outer curve. The claws of the forelegs are, *in situ*, slightly tucked under the tip of the leg making detailed observation difficult. The foreleg claws have been illustrated here as if the leg tips have been slightly splayed upwards. The rear legs are figured with claws and bristles as observed. A small coxal papilla (*cop*) is situated towards the base of both rear legs.

The cuticular plate pattern of *M. seteloso* is similar to the type species with 3 principal body plates above the forelegs and a caudal plate posteriorly. The caudal plate carries a pair of long ciri E (*ce*), each with distinct annulations in the midpart and a long tapering flagellum. The plate boundaries are not entirely distinct, however, and the pattern is considerably confused by the occurrence of intervening accessory plates and cuticular folds producing overall a wrinkled appearance.

The body is ornamented with numerous bristles. All bristles observed under the present alignment of the holotype are included in the figure though it is possible that some may have been overlooked on account of their small size or orientation.

Elucidation of further details and variations of the morphology of *M. seteloso* await the discovery of new material.

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Further records of *Crangonyx pseudogracilis* (Crustacea: Amphipoda) in the Clyde catchment

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Crangonyx pseudogracilis, a freshwater member of the amphipod family Crangonyctidae, is a North American species which was first discovered in Britain in the 1930s in the London area (Gledhill *et al.*, 1993). It occurs now in most of England and Wales and has been recorded in several rivers in northeast Scotland and is common in Loch Ness (Gledhill *et. al.*, 1993). It resembles superficially small pale specimens of the common genus *Gammarus*, but can be distinguished by the obvious serration on the posterior edge of the leg-like pereopods 3-5.

C. pseudogracilis was first recorded in this area from the Black Cart Water in 1990 (Doughty, 1992) and was found in 1996 in Loch Lomond in littoral kick samples collected by our biologists as part of the Environmental Change Network programme coordinated by the Institute of Terrestrial Ecology. Most recently, it was recorded in January 1998 from the Avon Water just upstream of its confluence with the river Clyde near Hamilton, and in October 1998 from the Clyde at two locations in Glasgow: Carmyle and Dalmarnock.

In view of the successful spread of this species so far, we expect it will be found in other parts of the area in the future.

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Extension of the Ringlet butterfly's distribution in southern Loch Lomondside

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In early July 1997, Mr K. Ritchie reported finding a small colony of the Ringlet *Aphantopus herperatus* L. in tall grassland at the north end of Balloch Park NS390835. Prior to this discovery, the butterfly was only known in southern Loch Lomondside from roadside verges on the region's eastern fringe - the Muirpark NS488915 and the Bog of Ballat NS527903, distances of approximately 13 kms and 15.5 kms from the new site.

As the Ringlet has a slow, rather feeble mode of flight, not particularly well adapted to long distance dispersal, it seemed unlikely that the colonisation of Balloch Park was achieved in a single move. Accordingly, in the following year a search was made of suitable habitat at several places in the intervening area. Despite the persistently bad weather experienced during the butterfly's flight period in July 1998, Ringlets were found along the river bank of the Endrick below Balfron bridge